Love China, But Not the Bomb: Toward A Cultural History of Western-educated Chinese Scientists

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Dedication

This thesis is dedicated to Hosen Lu, who plays bridge and watches hockey, yet uses the oven in the kitchen of his retirement home in Philadelphia to store shopping bags and has fond memories of the "Za shua (traditional performance of Chinese comic dialogues)" that he watched as a young man in Tianjin, China.

Abstract

Building on the author's own research experience in writing the life of one Chinese nuclear physicist, this paper discusses the conflict between his life and two narrative conventions that constrain the writing of biographies of western-educated Chinese scientists—biographies of "great men" and biographies of "great patriots." Cultural history is proposed as an alternative approach to scientific biography in writing the life of scientific individuals. A cultural history narrative of Hoff Lu unfolds the tensions in the twentieth century China by exploring the meanings he himself conceived in the daily experience of his life, especially his experience of Peking opera, which are significant for interpreting his choice to quit the Chinese nuclear bomb program.

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It is most difficult to decide what is right and what is wrong, what are the gains and what are the losses between these two views of life. My Chinese "self"...my twentieth century western "self"...It is a phenomenon of the transition period, and reflects the changes of time.

----Hu Shi

It is always hard to build something yet easier to knock it down.

—Sun Yat-sen

Introduction

This paper explores the issue of how to best approach the life of western-educated Chinese scientists. The inspirations have been accumulated through my research on a Chinese nuclear physicist, Hoff Lu. He was trained in nuclear physics between 1936 and 1941 at the University of Minnesota and continued publishing in this field after he returned to China. In 1942 he wrote a paper introducing nuclear fission and had it published in China's leading science journal, *Ke Xue* (Science), in 1944.[1] This paper ends with his observation that "this rich energy source is bound to have its special use."[2] Lu was certainly not the first person at that time to see the big potential of nuclear energy. During the several years after the U.S dropped two bombs in Hiroshima and Nagasaki in August 1945, the Chinese scientific community developed a great interest in getting hold of the scientific knowledge that had brought about this great scientific achievement. Lu was invited by the chief editor of *Ke Xue* to write a paper on the nuclear bomb. This paper was written in June 1946 and published in the journal's special issue focused on

1. Hoff Lu, "Zhong yuanzihe nei zhi qianneng jiqi yingyong"[The Potential Energy in Heavy Nuclei and Its Application], *Ke Xue* 27, no.2 (1944): 9-23.
2. Lu, "Zhong yuanzihe," 23.

nuclear energy in January 1947.[3] Titled "Yuanzineng yu yuanzidan (Atomic Energy and Atomic Bomb)," this paper explains the physics of nuclear fission and the technical details involved in making the nuclear bomb. His knowledge of the most effective methods for obtaining the pure U^{235} and Pu^{239} used in the Manhattan Project was informed by the Smyth Report as well his own training on mass spectrometry in Minnesota.[4]

This particular issue of the journal focused on atomic energy. It included an editorial,[5] a book review,[6] and a collection of statements by scientific organizations in Britain, Canada, the United States and China on the international control of atomic energy. Together they showed that the Chinese intellectual circle joined a worldwide campaign to reflect on the full meaning of the atomic bomb and the social responsibility of science and scientists. You can find a brief reflection along the same lines by Lu himself as a nuclear scientist in the concluding remarks of his paper. He wrote that human beings have a choice whether to make good use or bad use of nuclear energy.[7] Ten years later, he made a choice. He quit the nuclear bomb program after he had been selected as one of

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3. Hoff Lu, "Yuanzineng yu yuanzidan," *Ke Xue* 29, no. 1 (1947): 13-20.
4. In this paper Lu mentioned that the Chinese translation of the Smyth Report had been completed and was being processed for publication, but the copy he read was in English. Lu, "Yuanzineng," 13.
5. Mengwen Zhang, "Yuanzineng he Kexuejia de zeren (Atomic Energy and The Responsibility of The Scientists), *Ke Xue* 29, no. 1 (1947): 1-3.
6. Wen Lin, "Datong huo miewang," *Ke Xue* 29, no. 1 (1947): 28. The book being reviewed is Dexter Masters and Katharine Way, eds. *One World or None: A Report to the Public on the Full Meaning of the Atomic Bomb* (McGraw-Hill, 1946). This book is a compilation of articles written by 17 leading scientists, many of who had worked on the Manhattan Project.
7. Lu, "Yuanzineng," 20.

the leading experts to work on it by the new communist government of China. This decision, to some extent, has rendered him a marginal figure in the Chinese scientific community. And this decision also put Lu's life at odds with two narrative conventions in writing the biographies of western-educated Chinese scientists that model them as "great men in science" or "great patriots".

By diverging from a strictly intellectual biographical tradition, this paper explores cultural history as an alternative narrative for writing the lives of individuals using Lu's life as an example. A cultural history of Lu seeks the meanings in his experience of a cross-cultural life and provides insight into understanding the decisions he made. It considers the meaning of Peking opera together with the meaning of the atomic bomb and highlights the significance of Peking opera in Lu's decision to resign from the Chinese bomb program. The example of Lu's life also opens up a prospect of writing the cultural history of other western-educated Chinese scientists.

Biography of "Great Scientists"

The first narrative convention, which governs the writing of scientific biography in general and has considerable influence on the writing of the biographies of American-educated Chinese scientists, is scientific biographies written as the biographies of “great men” in science.

Biography has been a traditional genre used by historians of science ever since this discipline has been established. The grandest scientific biography project as a collective effort of historians of science must be the publishing of *Dictionary of Scientific*

Biography in the 1970s under the editorship of Charles Gillispie.[8] The sixteen volumes including a supplement, followed by another supplementary volume edited by Frederic L. Holmes, have been used as the classic, most authoritative reference for the practitioners in this field for several decades. To keep this enterprise up to date, New *Dictionary of Scientific Biography* was published in 2007 and provided further supplement to the original. As a matter of fact, there is a generation of well-known historians of science, a generation of scientists-turned-into-historians, who established their reputation by studying a particular scientist and his scientific ideas, and they are notable as the biographers of Newton, Einstein, Darwin and other major figures.

This general view of the relationship of scientific biography to history of science has been changed by some new historiographical trends. As Mary Jo Nye has commented,

> Some historians voiced misgivings about the enterprise and expressed objections to perpetuating a tradition of writing the history of science as the biographies of great men and great ideas. Social historians and sociologists challenged historians to write about the ordinary scientists, technicians, and instrument makers who do most of the work of science and to focus on disciplinary settings.[9]

Along with the change in the trends of historiography is a change of self-identification among a new generation of historians of science who were trained as historians of science

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8. The series mentioned here as well as in the rest of the paragraph are provided together in this one footnote. Charles Coulston Gillispie, ed., *Dictionary of Scientific Biography*, 16 vols., including Suppl. 1 (New York: Charles Scribner, 1970–1980); Frederic L. Holmes, ed., *Dictionary of Scientific Biography*, Suppl. 2 (New York: Charles Scribner, 1990); and Noretta Koertge, ed., *New Dictionary of Scientific Biography* (New York: Charles Scribner, 2007).
9. Mary Jo Nye, "Scientific Biography: History of Science by Another Means?" *Isis*, Vol. 97, No. 2 (June 2006): 323.

from the beginning and identify themselves more with general historians.[10] In their eyes, the kind of history of science that has been written in the form of scientific biographies is "weak history", as Mott Greene put it. Biographical history is weak history, because "a single life may be rich with vivid and absorbing detail, but it acquires historical meaning and importance only when it is folded into a narrative stronger than itself."[11] But Greene was not specific about what that "stronger narrative" is. He did mention that a strong narrative is something in which the biographical life resides and which gives it meaning and significance. It resembles what Mary Terrall termed "the cultural dynamics of science", or as in her title, "cultural history of science." What leads Terrall to think about the relation between the lives of individuals and historical arguments about culture, politics, intellectual movements, and so on, is the situation that has put biography in an awkward place in the discipline.

> Given that our discipline has moved away from treating science as a sequential accumulation of accomplishments and attributions of priority, associated with individual names, we may well ask why historians of science should be focusing on the lives of individual scientists. It is not hard to imagine biographies of great scientists feeding back into the progressivist grand narratives of old—so much so that historians of science who attempt biographies often feel it necessary to mount a spirited defense of the form, in a tradition going back more than twenty-five years.[12]

There is indeed "a spirited defense" of scientific biography as Terrall pointed out. Some historians, especially those who practice writing scientific biographies, stand up to

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10. Lorraine Daston, "Science Studies and the History of Science." *Critical Inquiry* 35, no. 4 (2009): 798-813.
11. Mott T. Greene, "Writing Scientific Biography," *Journal of the History of Biology* 40, no. 4 (2007): 3.
12. Mary Terrall, "Biography as Cultural History of Science," *Isis* 97, no. 2 (2006).: 307.

champion the legitimacy of scientific biography as a genre for writing scientific lives.[13] As a young historian of science whose first interest in science was cultivated by growing up reading scientific biographies, I can see the point for some historians to stand up for biography. Biography has its own long-lasting appeal to a variety of audiences outside the history discipline. Despite this, it is true that biography as a literary genre is subject to some narrative conventions. Greene argued that scientific biography, however useful, exerts a powerfully distorting influence on the image of how most science gets done. This argument applies to the writing of biographies in general. His essay discussed a variety of genre conventions and imperatives that continue to exert a powerful influence on the selection of biographical subjects and to control the plot and structure of the ensuing biographies. These “biographical imperatives” include the plot templates of the Bildungsroman (the realistic novel of individual self-development), the life trajectories of Weberian ideal types (ideal success story), and the folkloric tale of the "hero's quest."[14] Biographies written under such constraints are always structured as telling the life of a strong hero overcoming obstacles in the service of her or his self-development, and achieving the goals outlined as those appropriate to the trajectories of a master narrative. This explains well why in general the successful scientific biographies so far have been written on only a small number of famous scientists. Because scientific biography is

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13. See Thomas L. Hankins, "In Defence of Biography: The Use of Biography in the History of Science," *History of Science Cambridge* 17, no. 1 (1979); Thomas Söderqvist, "No Genre of History Fell under More Odium Than That of Biography: The Delicate Relations between Scientific Biography and the Historiography of Science," in *The History and Poetics of Scientific Biography*, ed. Thomas Söderqvist, 241-62. (Ashgate, 2007); Mary Jo Nye, "Scientific Biography."
14. Greene, "Writing Scientific Biography," 727.

meant to construct or represent notable or extraordinary performance, a large number of people whose lives do not fit in its template are denied biographical treatment. In particular, those biographical imperatives also tend to exclude women from being chosen as the subjects for scientific biographies, because discriminatory practices and social constraints that women have to cope with in order to make a career in science mean that only a very rare number of women's lives can live up to the biographical stands of "great men."[15]

However, what Greene described as “biographical imperatives” are not strongly present in my research and writing of Lu’s life. Lu has not been widely known in China. The Chinese government has given a special prize of “Two Bombs and One Satellite Meritorious Award” to twenty-three scientists and engineers who have made great contribution to China’s two bombs and one satellite projects in September 1999. Ten out of these twenty-three were experts in nuclear science,[16] among whom were colleagues Lu had worked with and students he had taught over the years. But his name is not listed there. In fact, I have lived most of my life in China and did a Masters degree in history of physics while I was in China, but I didn’t hear his name until I came to study at the University of Minnesota in 2011. Lu’s name is hardly known in western literature on China's bomb project either. Lewis and Xue’s widely cited book, *China Builds the Bomb*, provides a list of key figures in China’s Nuclear Weapons Program from 1954 to 1967 at

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15. For a discussion on biographies of women in science, see Sally Gregory Kohlstedt, "Women in the History of Science: An Ambiguous Place," *Osiris* 10(1995).
16. "Liangdan Yixing Gongxun Jiangzhang (Two Bombs and One Satellite Meritorious Awards)," last accessed April 10, 2014, http://zh.wikipedia.org/wiki/两弹一星功勋奖章.

the end of the book. 15 scientists are on the list, but again Lu's name is absent.[17] Therefore Lu is not at all a model of a scientist who made his way to becoming a scientific hero. His life doesn't provide strongly what Greene called "biographical imperatives" for completing a biography of Lu that would be admired by its readers. In fact, someone who intends to write a biography of Lu may find it rather frustrating, just because his life is not celebrated with big awards or exciting achievements in science.

Lu's life poses a problem for biography as the approach to writing the life of scientists. On one hand, more awareness should be raised about a common imperative among authors of biographies to glorify their subjects. Because such a glorifying imperative comes out of the underlying genre convention in biography writing, it is hard, if not impossible at all, to get rid of as long as they stick to writing a biography project. On the other hand, if scientific biographies are meant to be about the life of great scientists and the writing of scientific biographies tends to magnify the significance of their life, then this question should be asked: is there an alternative approach to writing the lives of scientists that doesn't rely on the scenario of great men in science?

Biography of "Great Patriots"

The second narrative convention applies only to the writing of the lives of returned Chinese scientists with western education. Wang Zuoyue has pointed out in his work reviewing the historical scholarship on modern Chinese science and the state that there is a remarkable difference between the scholarship inside and outside China on the topic of

17. Litar Xue and John W. Lewis, *China Builds the Bomb* (Stanford: Stanford University Press, 1988), 246-250.

the historical studies of science and technology in modern China. While Western scholars have focused their analysis on the state control of science and scientists, Chinese scholars, not exclusively historians, have produced a large quantity of works under "a descriptive approach with an emphasis on biographical, institutional, and disciplinary histories and on the theme of Chinese nationalism," an interesting phenomenon as an impact of the state control of science and scholarship related to science in China. Wang wrote that

> …the official policy of modernization based on science and technology in the post-Mao era has continued to enhance the political and social status of Chinese science and scientists and therefore has provided the political cover for scholars to write biographies of scientists and histories of scientific institutions. In the name of patriotic education and learning from history, even the government has sometimes sponsored such studies. Both kinds of writings have tended to emphasize scientists' nationalism, and both have acknowledged the damage done by various political movements, especially the Cultural Revolution; but, not surprisingly, those writings directly sponsored by the government accentuated the positive developments. In neither case did the state completely disappear from the scene, but it often took on such an undifferentiated form, without any internal tension or evolution, that it nearly lost its interpretative force.[18]

I think this paragraph, especially the last few words, serves as an outspoken and incisive critique of "a patriotic narrative" that pervades the writing of biographies of Chinese scientists that I have been exposed to in Mainland China. The missing "internal tension or evolution" in such a narrative is especially problematic in the cases of those Chinese scientists who had experienced western culture. And this group of scientists represents an extremely large portion in the Chinese scientific community through the twentieth century. Among the 679 scientists who are included in the six volumes of *Dictionary of the Scientific Biography of Modern Chinese Scientists* (published in 1991 and arguably the largest and most resourceful biographical project of science that has

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18. Zuoyue Wang, "Science and the State in Modern China," *Isis* 98, no. 3 (2007): 565.

been carried out within the People's Republic of China), 544 have had educational experience abroad before they returned to China, not including those who received western education inside China.[19] Constrained by a political sentiment of Chinese nationalism, the biographies of these returned scientists in the six volume series present a sweeping image of them as enthusiastic patriots. Chinese nationalism and patriotism are unexceptionally the motivations that drove them to go overseas to Japan, Europe and the United States and then to return to China. The narrative is always a consistent one.

Historically, however, this account is not accurate. There has been a long strand of criticism against those with western education in Chinese society in the past. It can be traced from the very beginning when the first hundred young Chinese students sent to the United States for education were called back by the Qing court and it persisted all the way through the communist era of Mao. The classical rhetoric of criticism and skepticism had already been formed by the 1920s, summarized neatly in a book called *Jindai zhongguo liuxueshi,* which later became a classic work on this topic.[20] The author, Shu Xincheng, thought that the endeavor of sending Chinese students abroad had produced virtues as well defects, but the defects outweighed the virtues. His overall assessment of Chinese students who had acquired western education tended to be negative. This early scholarly work has been considered important and reliable, because the author drew on multiple sources and statistics covering a period of sixty years, and above all, his opinion reflects the public opinion around the time the book was published. Shu wrote:

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19. The statistics comes from Peifu Zhang and Li Wei, "Jindai liuxuesheng yu Zhongguo gongcheng jishu de fazhan," *Kexue Jishu Yu Bianzhengfa* 6(2003): 65.
20. Xincheng Shu, *Jindai Zhongguo liuxueshi* (History of Studying Abroad in Modern China) (reprint), (Shanghai: Shanghai shudian chubanshe, 2011).

"Newspapers and magazines in recent years often publish articles on issues related to foreign educated students. Although those opinions are not all the same, they can be summarized in one word—unsatisfactory." Some of the articles even held the extreme view that "studying abroad is bad enough to cause the fall of China."[21]

As part of his conclusions, he leveled three major charges at those returned Chinese students with western education, which had led to the "unsatisfactory" result. First, they failed to learn what their country really needed and to put what they had learned to use for the benefit of the whole country. Secondly, they demonstrated a selfish desire to use foreign education as a means to achieve wealth and power for themselves, their families and their clans. The third major charge is that those Chinese students became westernized and betrayed their Chinese identity.[22] The author explicitly called some of them "traitors."[23] This negative attitude remained through the communist era, when it was combined with the communist ideology and grew bitterly into vast political campaigns persecuting foreign-trained intellectuals. This line of evolution of public opinion in Chinese society will be touched upon in more detail in the narratives about Lu later in this section and the next section.

In fact, not until the late 1980s, following the reform and opening-up of the People's Republic of China, did the argument switch to the overwhelmingly positive and patriotic narrative that has become the norm for today's writing of the lives of Chinese scientists returned from abroad. As mentioned before, such narratives were critiqued by Wang as

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21 Shu, *Jindai Zhongguo liuxueshi*, 137.
22 Ibid, 140.
23 Ibid, 137.

missing the "internal tension or evolution." A Taiwanese scholar, Chiang Yune-cheng reviewed the research that has been done on the topic of Chinese students studying in America from Shu Xincheng onward and concluded that those studies within current Chinese academic circles have not directly confronted the conclusions of Shu and similar reflections by western scholars. Chiang also echoed Wang's critique in his conclusion:

> It is a pity that works of praise have not directly challenged the critical position. The research of current Chinese academic circles on modern Chinese studying abroad are basically overturning the previous verdict. In other words, if the propaganda of the Chinese Communist Party soon after 1949 was devoted to seeking out negative materials in order to prove the comprador[24] and reactionary nature of modern Chinese returned scholars, then today's Chinese researches are doing just the opposite. They focus on searching for positive materials to prove that the returned scholars were patriotic and progressive.[25]

Therefore the patriotic narrative convention has lost the contentious aspect of this important chapter of Chinese history. It is necessary to break away from the convention and restore the lost tension to our narrative of history. It is more appropriate to treat it as a tension between Westernization and Chinese nationalism, rather than naively think that returned Chinese intellectuals are consistently great patriots. Whether returned Chinese intellectuals are patriots or traitors is a riddle that is difficult to resolve, not only because the society has often attached both labels to the same individuals, depending on the period in China's cycles of attraction to or rejection of the West,[26] but also it comes as a

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24 A word used formerly in China and some other Asian countries to refer to a native agent of a foreign enterprise.

25. Y. C. Chiang, "Chinese Students in America in the Early Twentieth Century-Preliminary Reflections on a Research Topic," *Chinese Studies in History* 36, no. 3 (2003): 52.

26. Stacey Bieler*, Patriots or Traitors: A History of American Educated Chinese Students* (ME Sharpe, 2004), xii-xiii. As suggested by the title, this book unpacks the

result of the ambivalent character of these individuals' lives who lived across the boundary between Chinese and western culture.

For me, it is just this ambivalence that makes Lu's life across the boundaries between two cultures a most intriguing and vigorous example of human life. It started as early as when Lu lived in the United States from two to four years old with his father, who studied at the University of Illinois, and later lived in a house his father bought in the foreign concessions of Tianjin City after they returned to China. Lu first received education in Confucian classics and then a new style education, which had strong western influence. The high school Lu attended used English-language textbooks in physics and mathematics. Later at school he had a physics teacher who held a Masters degree from Great Britain. In 1932 Lu attended the Physics Department at Yenching University located in Beijing. The Physics Department hired both Chinese and Western faculty members. The majority was Chinese but with western education.

Looking into a narrative of Lu's life as a Yenching student reveals a full spectrum of the issues that were raised earlier in this section about western influence on Chinese education.

Yenching University was a missionary university, the most prestigious one among its kind in China during that time. Its president John Leighton Stuart was a China-born American missionary. For decades serving as Yenching's president, he promoted the

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patriots/traitors riddle in great length by presenting short biographies of fourteen Chinese individuals who went overseas to study. Western scholars like Bieler are more independent of Chinese politics and thus their works are less constrained by the same narrative convention that constrains their Chinese colleagues. However, the author has selected her biographical subjects with an explicit religious agenda. Those who were selected had almost all been converted to the Christian religion.

cosmopolitan outlook of Christianity with a vision of the possibility of applying it to the specific Chinese environment. Under his leadership, the administration at Yenching University was characterized by a bicultural approach. The university's 1930-31 *Guidebook* for students stated that the introduction of "finest values of western civilization" would be done in a way that allowed the Chinese people "to infuse these into their own culture while presenting the best features of their national heritage."[27] In practice, on one hand, Yenching University facilitated the transmission of new domains of knowledge from the West into Chinese academia, including sociology, journalism, western medicine, economics and political science, in order to provide the intellectual breadth and freedom of a Christian liberal arts education. On the other hand, it offered one of China's strongest programs in *guoxue* (Chinese studies or national studies). The curriculum was indigenized and Sinified to include Chinese literature and history.[28] The indigenization and Sinification were conspicuously represented by the traditional Chinese-style architecture in its new campus located in the suburb of Beiping (Beijing). Yenching also housed the office of the Harvard-Yenching Institute in Beiping. The institute had been established to fund research in Chinese studies by scholars on both sides of the Pacific using western scientific methods.

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27. Arthur Lewis Rosenbaum, "Yenching University and Sino-American Interactions, 1919-1952," in *New Perspectives on Yenching University, 1916-1952 : A Liberal Education for a New China*, ed. Arthur Lewis Rosenbaum (Chicago: Imprint Publications, 2012), 30. The book is a collection of articles that represent the most recent scholarship in the study of the history of Yenching University.
28. Arthur Lewis Rosenbaum, "Introduction: Revisiting Yenching's Experience of Biculturalism," in *New Perspectives on Yenching University, 1916-1952 : A Liberal Education for a New China*, ed. Arthur Lewis Rosenbaum (Chicago: Imprint Publications, 2012), 10.

Another significant symbol showing Yenching student's engagement with traditional Chinese culture was the student National Opera Club. Around this time, Peking opera became identified and held prestige as "national opera." Peking opera (more recently known as Beijing opera) is a form of traditional Chinese theatre that combines music, vocal performance, painted face, exquisite costumes, graceful gestures and acrobatics. The stories are based on Chinese history and folklore. A significant number of students at Yenching University were fond of Peking opera and founded the club in 1934; it was supported by the Sinification policy of the university. The same enthusiasm for Peking opera gathered them together every Friday afternoon for rehearsal. The sound of traditional Chinese musical instruments and Peking opera singing mixed together with the sound of piano and modern-style singing from a nearby building. The members of the club could take on various roles and put together a play. The club gained a social reputation for holding public performances. Those performances were not only attended by Yenching faculty and students, but also attracted local residents outside the university.[29] As a founding member of the club, Lu had his own performance on stage for the first time. He was nervous but delivered his performance successfully. A positive comment in the local newspaper brought him a sense of accomplishment. During the weekends, he would go into town and see the performance of the great masters of Peking opera.[30] Every time he learned something by watching. Rooted in the capitol of Peking

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29. Zengqing Yang, "Yanda guojushe shilue," in *Yanjing daxue shigao: 1919-1952*, ed. Weiying Zhang and Baiqiang Wang (Renmin Zhongguo chubanshe, 1999), 540-550.
30. Lu has published a series of memoirs that combine into an autobiography. See Hoff Lu, "Wang shi hui yi (Memoire) (1)," *Xiandai wuli zhishi* 4 (1991): 25-26; "Wang shi hui yi (Memoire) (2)," *Xian dai wu li zhi shi* 5 (1991): 23-24; "Wang shi hui yi

opera, and nourished by the National Opera Club at a missionary university that encouraged traditional Chinese learning, Lu's experience with Peking opera grew over time to hold an increasingly significant meaning in his life.

Both Chinese and English were used as the language of instruction and in everyday communication. Arthur L. Rosenbaum wrote that Yenching "produced a core of graduates comfortable in both Chinese and western cultures" in the four decades of its existence.[31] However, the immersion in western culture present in the life of Yenching students did not escape public criticism that reflected nationalist sensitivities to what some considered as an overly westernized life style.[32] In response, Yenching students showed their strong Chinese national identity by standing in the forefront of the student movements against Japanese aggression in the 1930s. Like hundreds of other patriotic Yenching students, Lu also volunteered during the famous student protests on December 9, 1935. He volunteered as a picket to ride his bike along the procession of students and went through a conflict with armed police sent by the nationalist government. Stuart and other Yenching administrators supported the student movement because they believed that it was in line with Yenching's motto "freedom and truth through service."

Stuart and many western faculty members maintained close professional relationships with Yenching students. Lu was recommended for study in Minnesota upon his graduation by the chair of the physics department, William Band, who was British, and a

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(Memoire) (3)," *Xian dai wu li zhi shi* 6 (1991): 19-20; "Wang shi hui yi (Memoire) (4)," *Xian dai wu li zhi shi* 1 (1992): 25-26; "Wang shi hui yi (Memoire) (5)," *Xian dai wu li zhi shi* 2 (1992): 28-29. The source being used here is Lu, "Wang shi hui yi (Memoire) (2)," 23.

31. Rosenbaum, "Yenching University and Sino-American Interactions," 24.
32. Ibid., 55-56.

physician friend of Band's--- a Minnesota alumnus. Lu recalled in one of his interviews that before he headed off for Minnesota that Stuart had met with him in his hospital ward and welcomed him to go to the United States.[33]

The Yenching experience is an important episode of Lu's life showing that many small pieces of everyday life came together to embed culture, both Chinese and western, and became significant in shaping his across-cultural outlook. As Geertz put it, each piece was "a speck of behavior, a fleck of culture, and *voilà!*—a gesture."[34] But the Yenching experience is only the tip of the iceberg that represents the ambivalent relationship between Chinese culture and western culture during their encounters in the first half of the twentieth century. Lu's generation of western-educated Chinese students in general, had acquired, often from a very early age, what Hu Shi, the renowned Chinese scholar who was himself a returned student, described as two quite different outlooks on life and two different identities; and the two sometimes conflicted with each other. Hu Shi wrote:

> It is most difficult to decide what is right and what is wrong, what are the gains and what are the losses between these two views of life. My Chinese "self"...my twentieth century western "self"...It is a phenomenon of the transition period, and reflects the changes of time.[35]

It is the phenomenon that Hu Shi and Lu's generation of western-educated Chinese intellectuals had to live with, and therefore, those who study the history of modern China need to address. There will always be some essential tensions between two different

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33. Hoff Lu, interview by Delu Wang. Shanghai: May 17, 1990.
34. Clifford Geertz, *The Interpretation of Cultures: Selected Essays*, vol. 5019(Basic books, 1973), 6.
35. Hu Shi to Tao Menghe, May 8, 1918, in *Hu Shi yigao ji micang shuxin*, Vol. 20, ed. Yunzhi Geng (Hefei: Huangshan Shushe, 1994), 103.

cultures, especially when one is an old Eastern culture in a troublesome transitional period and the other is a young, modern, and scientifically and technologically much more superior Western culture.

Because the patriotic narrative only focuses on one side of the tension, it runs into problems when I try to understand two significant decisions Lu made. Lu decided to go back to China to serve his country in 1941. It seems that he is a patriot. But even when his specialty could be useful to his country, he subsequently made another decision to quit his job on the Chinese bomb program. His patriotism to his country was at stake in this second decision. It put him at odds with his contemporaries and even today is not understood by his fellow countrymen. So there seems to be a contradiction between the two important decisions he made in his life where the story of patriots would fail to offer a coherent narrative.

Love China, But Not the Bomb: A Cultural History of Hoff Lu

The Chinese bomb program has been celebrated as both a great scientific endeavor and a magnificent case of scientific patriotism in the history of the New China. Lu's decision to withdraw from it in 1957 is uncongenial to that prideful and patriotic discourse. This decision has also contributed, to some extent, to the marginalization of his standing in the scientific community in China, especially the community of nuclear physics. His influence either in science or in society at large is marginal, even though he remained active in teaching and research in prestigious institutions until he retired and died. His life thus seems at odds with both narrative conventions that constrain the historical biographies of western-educated Chinese scientists. He is neither a "great man"

of science according to the imperative for the standard writing of scientific biographies, nor a model of "great patriot" as returned Chinese scientists were portrayed in the biographical and historical works produced by Chinese scholars.

Since Lu's life fit into neither the model of great man nor the model of great patriot, can we draw the conclusion that he is not significant and there should be no study of his life at all? As shown in the previous two sections, both narrative conventions tend to have an exclusive and distorted influence on what history should be about and how history should be written. History is not all about great men; history of science is not all about great scientists; and history of western-educated Chinese scientists is not all about great patriots. If scientific biography as a genre is meant to be about the life of great scientists, and the writing of scientific biography tends to magnify their greatness, is it possible to find an alternative way to tell the life of scientists that doesn't have to esteem their life as something great and will historians see the significance even in the lives of those scientists who are not enthroned with big titles? My answer is yes, and cultural history can be considered as such an alternative.[36]

Following the so-called “cultural turn” in recent historiography, cultural history has become a major trend for doing history. The term "cultural history" has been widely used by historians, often without a clear definition of what exactly cultural history is. Although

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36. Even though this paper tries to take cultural history as an approach that methodologically distinguishes itself from the traditional modes of scientific biography, It must be made clear that it is not the author's intention to set cultural history up in opposition to scientific biography. In fact, some recent scientific biographies have been greatly enriched by taking seriously the cultural contexts of scientific practice and ideas. As Terrall's and Nye's articles suggest, this kind of scientific biographies can be read as cultural history, or can be considered as one particular means of writing cultural history of science.

the "new cultural history" started to come into fashion in the 1980s and the idea of cultural history was around for much longer than that, an outspoken common ground for cultural history has not been formed until very recently. A new discipline coming into shape is often marked by the establishment of its own institutions and its own journal. As a sub-discipline of history, cultural history did not form its own society until the International Society of Cultural History was founded in 2008. The first issue of its own journal, *Cultural History*, didn't come out until 2012. The journal describes its disciplinary approach as the following, which provides a common stand for practicing cultural historians:

> *Cultural History* is therefore all about the ways in which people in the past orientated themselves as individuals and groups towards other individuals, groups, regions and countries, the environment, and the world in general – and how those orientations changed.[37]

This statement contains a new interpretation of the term culture that is different from the common sense understanding of it. Instead of having culture referring to art, literature and music, the concept of culture in the cultural historians' mindset identifies closely with that of anthropologists, most notably Clifford Geertz. In his seminal work "*The Interpretation of Culture*," Geertz adopts Max Weber's idea that "the man is an animal suspended in webs of significance he himself spun," and defines culture as these "webs of significance," or in other words, "systems of symbols" by which man confers significance upon his own experience and which "provide human beings with a

37. "ISCH-Journal," accessed November 13, 2013, http://www.culthist.org/isch-journal/

meaningful framework for orienting themselves to one another, to the world around them, and to themselves. "[38]

So, if biographies are concerned with what is considered as significant from a modern point of view, cultural historians are concerned with what people themselves thought was significant in their life in the past. It is this different concern for significance that has distanced cultural history from grand historical narratives and the narratives spotlighting "great heroes," centering instead on the experience of everyday life and ordinary people. A big breakthrough of cultural history is that it has made the experiences, actions and habits of individuals or groups -- largely unknown or neglected in history -- legitimate objects of historical inquiry and has continuously produced impressive works in this direction.[39]

Instead of framing Lu's life as the life of a great scientist, or a great patriot, with its own agency and integrity largely untouched, cultural history positions me to tell Lu's life of struggling for meanings as an individual human being living across two cultures and working to balance their influence in his own identity and intentions. Perhaps the best way to understand how some of his significant life decisions make sense is by showing how he himself made sense of the events at the time and in retrospect. I have tried to pull together, as much as I can, the multifarious events in which Lu's life was involved, with

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38. Geertz, *The Interpretation of Cultures*, 250.
39. Peter Burke was not exaggerating when he recently commented that almost everything seems to be having its cultural history written these days, including flower, alcohol, cleanness, terrorism, the human body, etc. However, it is relatively rare to come across the cultural histories of individuals. A classic example must be Carlo Ginzburg's book *The Cheese and the Worms: The Cosmos of a Sixteenth-Century Miller.*

broader details added when necessary. The symbolic meanings scattering in what has been written about his life by himself or others serve as clues for him to think about and act upon those events. When Peking opera and the nuclear bomb, two seemingly uncorrelated pieces of Lu's experience, come together in a cultural history narrative, Lu's decision to quit the Chinese nuclear bomb program starts to become more understandable.

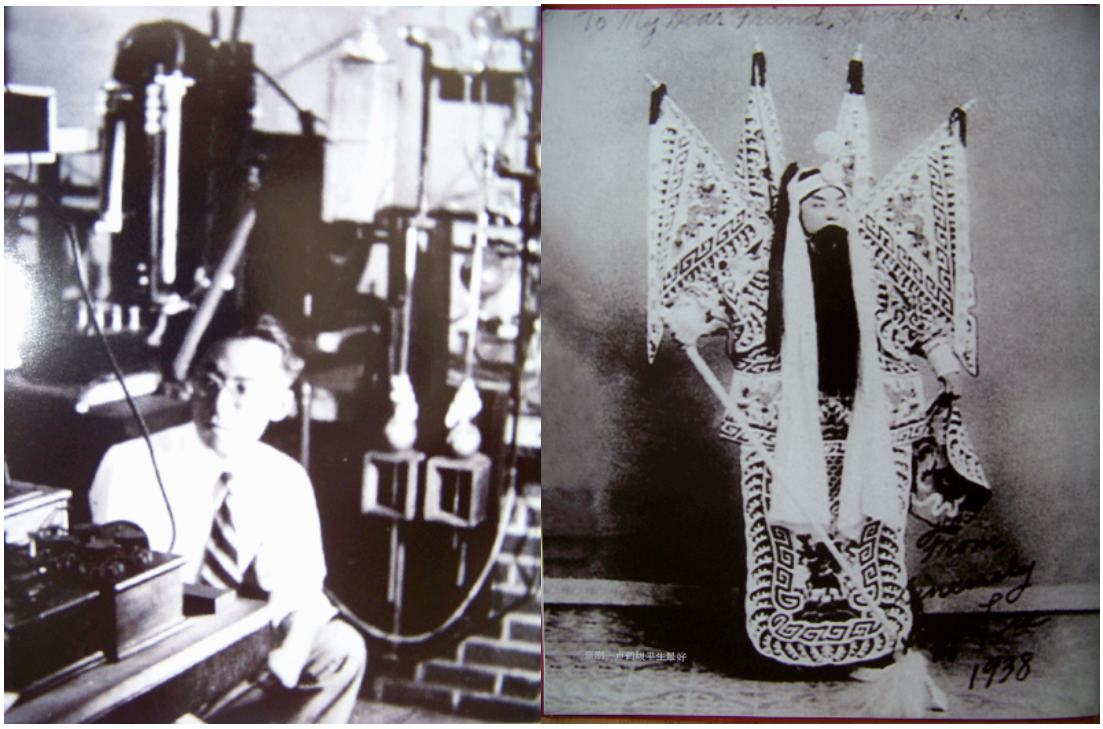

Fig 1. The photo on the right shows Hoff Lu in the physics lab at the University of Minnesota where he was a graduate student between 1936 and 1941. The one on the left was taken during his Yenching years, featuring him in traditional Peking opera costume. This latter photo was signed by him and given to his closest American fellow student Arnold Cohen as a gift. Photos courtesy of the University of Minnesota Archive.

After receiving a PhD degree from the University of Minnesota in 1941, Lu and his bride Runhui Wu, a Chinese woman who practiced nursing at St. Mary's Hospital of Mayo Clinic, decided to go back to China to "teach their fellow countrymen what they

learned in three years of study in America."[40] This was the time when China was still at war with Japan. Because of the turmoil caused by the war, many universities had retreated from the cities and relocated to the remote areas of Southwest China. When Lu and his wife arrived at the first university where he was going to teach, the chair of the Physics Department joked that this newly married couple had dropped from the heaven to the hell. Lu subsequently taught at several universities, and the last one before the Communist Party came into power was Zhejiang University.

While I have shown that Western influence and Chinese tradition are both significant in Lu's life, the new communist government showed a tendency to discard both. In August 19, 1949, at the point when the communist army was going to win the civil war and drive the nationalist party out of power and out of Mainland China, Mao Ze-dong published a very famous newspaper article in *People's Daily* to celebrate his victory and the failure of American colonialism in China with the collapse of the nationalist government. In this article, he was addressing the "shortsighted" Chinese intellectuals with a liberal and democratic individualism ideal and, especially, those who "hold onto an illusion about the United States." This article implies the communists' anti-U.S. and anti-westernization policy began very early in the political shift. And it is worth pointing out that the title of this article is "Goodbye, Stuart." This is the same John Leighton Stuart who had been the president of Yenching University when Lu attended it, who later became the U.S ambassador to China under the control of Chiang Kai-shek's nationalist party and was forced to leave the country after its fall, who said that he was "Chinese

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40. Alfred O.C. Nier papers, Box 5, Folder Hoff Lu. The University of Minnesota Archive.

more than he was American," and whose last wish was to be buried in China after his death. Mao used Stuart's leaving as a symbol of the complete failure of U.S policy towards China. Stuart's leaving also symbolized that all the connections between China and the United States would be cut off. Lu certainly recognized the political signs. He changed the language he used in lecture from English to Chinese right after the communist army took control of Zhejiang University in 1949.

Following the change of political power, the new administration took over the higher education system through a nationwide higher education reform in 1952. Missionary schools had been taken over and then abolished. After the higher education reform was finished in 1953, no missionary school existed anymore in China. All university departments and curricula, which had adapted British or American systems, were reorganized following the Soviet Union model. The university system of liberal education, which had been borrowed from the British or American system and gave the students a general knowledge in a wide range of subjects for the first few years before they went on to their specialized field of study, was replaced by the Soviet Union model which was characterized by specialized education in one particular field from the beginning and restricted transferring between disciplines.

Another fundamental change that reflected the political interference exerted by the newly established communist authority over the organization of China's higher education was the nationwide reorganization of the higher education institutions and consequently, the redeployment of faculty and students. The primary goal of higher education was reoriented to training skilled manpower to serve the industrial undertakings of the new

socialist country. This change proved radical and most controversial. Eight years later when he visited the United States for the third time as the Cornell Visiting Professor of Physics at Swarthmore College, Lu reflected on this education reform in China and described it as "a simultaneous process of fissions and fusions."[41] What he means by the word "fission" is that big universities were split into separate parts according to their disciplines, and then these parts were dispersed elsewhere. The word "Fusion" was used by Lu to describe how small colleges of similar nature in the same area were combined into one big university. From Lu's perspective, the analogy between the 1952 education reform and the processes of making nuclear bombs also held in the sense that they both have enormous destructive power. Lu saw the higher education reform as "a revolutionary measure apparently aimed at destroying old traditions" in order to "prepare for new developments."[42]

Under the control of this new grand scheme, Zhejiang University, among many other universities, was changed into a technological school. Its departments in the science and humanities domains were cut. Lu and other faculty were transferred, together with their families, to Fudan University located in Shanghai. As a result of this, Zhejiang University, which had been given the name of “the Oriental University of Cambridge” by British historian of science Joseph Needham after his visit to this university in 1944, was largely crippled.

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41. Hoff Lu, "Fissions and Fusions, " Swarthmore College Bulletin Summer (1980): 56. Lu also went back to the University of Minnesota during his visit to give a talk on Chinese higher education, presumably also using the fission and fusion analogy.
42. Lu, "Fissions and Fusions," 56.

The situation of the faculty whose specialties were in western philosophy, sociology and political sciences were more awkward. They were not allowed to teach the knowledge and perspectives they had acquired under western influence. They had to abandon their old specialties and reform their mindset by studying Marxism.

Another major change that removed western influence was the abandonment of teaching English. Instead, Russian was taught as the primary foreign language at school. As the academy in general also turned to the Soviet Union for the import of ideas and experience in both teaching and research, Lu was asked to use textbooks in Russian in his teaching and he also translated two textbooks from Russian to Chinese, one on atomic physics, and the other on integral equations, after he taught himself scientific Russian using a book with English as the instruction language. Lu could speak and write fluent English due to the solid language training he had received when he was young. This was quite common among the generations of Chinese intellectuals around his time. It became rare in the younger generations who grew up following the communist reform of education.[43] Today this reform is seen as a cut-off from an intellectual tradition established by the effort of several generations, and a great disaster in the higher education of modern China.

The Communist Party's anti-western campaign reached its climax during the Anti-rightists Movement starting 1957. Many intellectuals who stood out in 1956 by expressing viewpoints that were at odds with the party's line only set themselves up as

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43. The Renaissance and Shakespeare expert Stephen Greenblatt wrote about his experience of noticeable difference in English competency among several generations of academic Chinese during his visit of China in 1983. Stephen Greenblatt, "Chinese English," *The Threepenny Review* 12 (1983): 4-7.

targets for being oppressed. "Anti-rightists" was the name under which they were classified. Peking University was the center of the Anti-rightists Movement. Seven hundred and sixteen faculty, staff and students were accused of having bourgeois liberal ideals. A large number of them were intellectuals with western education. Many former Yenching faculty and students were denounced as “rightists” and became the victims of this movement. Just a mile away from Peking University was Tsinghua University. There one of Lu’s former physics instructors at Yenching University, Meng Zhaoying, was denounced as a notorious “rightist” in the summer of 1957 after he voiced his dissent on the issues of university education. There were endless meetings and writings aimed at attacking his liberal and pro-American stand.[44]

When the movement started, Lu happened to be in Beijing -- the center of that upheaval. In 1955, the Ministry of Higher Education asked Lu to leave his job in Shanghai and move to Beijing immediately. Lu left for Beijing in such a rush that he was not able to take his family with him. The family was arranged to reunite with him later. Lu was not told a single word as to what this urgent mission was about until he arrived in Beijing and was settled down at Peking University. It turned out that a secret program had just been established at Peking University for training technical personnel working on making China’s first nuclear bomb.[45] This program scouted several scientists with

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44. Rosenbaum, "Yenching University and Sino-American Interactions," 342.
45. This is not China's first bomb project. Shortly after the explosion of nuclear bombs in Japan in 1945 demonstrated the enormous nuclear power to the world, the Kuomingtang authority launched a secret project to send people abroad to gain training for building China’s own bomb. It was aborted due to the breakout of the civil war and the nationalists’ losing power to the communists. See Shiping Wang, Yanping Li and Nianzu Dai, "Ershi shiji sishi niandai jiangjieshi he guomin zhengfu de yuanzidan zhi meng

expertise in nuclear physics to form its faculty, of which Lu was one. It recruited third- or fourth-year students from universities all over the county. Because the information about the program was kept confidential from the public, the faculty and students would only write “PO. Box 546”in their mailing address. Later this program was known by the code name “546”.

A new department, which exists to this day as the Department of Technical (Nuclear) Physics, was founded at Peking University for training personnel with all the theoretical knowledge needed for the future bomb project. As a faculty of this department, and a senior expert in this secret project, Lu taught two courses on neutron and accelerator physics between 1955 and 1957. Those who attended were university students, students in military uniform, and a few faculty members. Several years later those students would become the backbone for China’s bomb projects.

Peking University was not an unfamiliar place for Lu. The campus of the new Peking University was based on the campus of Yenching University after it was closed in 1952. So for him, it was like a “return” to his alma mater after 20 years. But life was so different now than it was 20 years ago. It seemed to him that his alma mater was gone for good together with its liberal arts tradition and Christian cosmopolitanism. The liberal upper class atmosphere of the former campus was replaced by the control of proletarian ideology over every part of the campus life. Lu was at the center of this Anti-rightists

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(Kiang Kai-shek and the Nationalist Government's Dream of the Atomic Bomb in the 1940s), " *Zhongguo kejishi zazhi* (The Chinese Journal for the History of Science and Technology) 3 (2006): 197-210; Shenghua Hu, "1945-1948 zhongguo de yichang hewuli re, " *Zhongguo keji shiliao* (China Historical Materials of Science and Technology) 4 (1998): 40-44.

upheaval in Beijing, so it was impossible not to feel its effect. His third son told me that from inside the apartment where they lived near campus, his family could see the movement going on outside. At one of those meetings with the party members, his father refused to speak about his opinion and asked not to be involved. Probably because he was under the protection of the secret nuclear program, he was neither declared a rightist nor attacked during this period of trouble.[46]

When the communist ideology reached its extreme expression, it argued not only against westernization, but also against tradition, particularly against traditional Chinese culture and art. A famous quote came from Mao's speech at the second plenary meeting of the Seventh Conference of the Communist Party held in Xibai Po in March, 1949: "we are not only good at destroying the old world, but will also be good at establishing a new world." This quote not only expressed the new leader's confidence with the prospect of taking over the government of the nation but also made it explicit that the core of the communist ideology was revolution. Revolution was a doctrine. The communists extended this doctrine from politics to every other aspect of the society including art. Peking opera epitomized the highest achievement of the form of traditional art, but its content reflected the traditional values of the old society, which fell a victim to the revolutionary scheme.

Perhaps the most significant symbol and clue about the core meaning as well as the complexity of Lu's life is Peking opera. Lu had fallen in love with this traditional Chinese art since he was a child. Its significance in Lu's life grew deeper as he formed an

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46. Yongfang Lu, phone interview by the author. January 10, 2013.

intimate relationship with it on an almost daily basis over the years. He mentioned Peking opera in eight different places all through a short autobiography of about seven pages in Chinese. He carefully recorded the Peking opera performances he had given for various public circumstances through his life. His son told me that Lu sang Peking opera almost every day until his death. He often joked that if he had not become a physicist, he might have turned into a professional Peking opera performer.[47] He found a way of combining the two: sometimes he would draw on a little bit of Peking opera during his physics lectures, which was intended to be mnemonic as well as entertaining. So Peking opera certainly had a pervasive meaning in Lu's life.

Even when he was studying in the United States, Lu was still engaging with Peking opera. Living abroad added new and special significance of Peking opera to Lu's life. In 1940, Lu performed one of his favorite Peking operas— "Si-lang Visits His Mother" at the University of Minnesota. It was organized by Chinese students as a patriotic effort to raise money for supporting their fellow countrymen's anti-Japanese war.[48] Lu played the major male role—Si-lang.

Of the ten public performances that have been mentioned in the primary sources, "Si-lang Visits His Mother" was his favorite Peking opera, and he performed it at least six times on formal occasions in addition to his informal singing at home and even, occasionally, in the classroom. As one of the earliest Peking operas, it represents the highest achievement of Peking opera as a traditional Chinese art and has retained great

47. Yongfang Lu, phone interview by the author. January 10, 2013.
48. Baoyan Hu, "Wulixue dashi he jingju laopiaoyou-ji Lu Hefu jiaoshou," *Minzhu Yu Kexue* 5 (1993): 36-37.

popularity among generations of Chinese opera theatergoers. It was also the signature performance of the well-known Peking opera artist, Tan Fuying, whose performance Lu relished most during his college years in Beijing. The story, "Si-lang Visits His Mother," was situated in the Song Dynasty at the border between Song and its enemy country, Liao. Si-lang (the fourth son) came from a family that was famous for their great service in the war. During a furious battle, Si-lang's father and brothers were killed. After Si-lang was captured, he survived by hiding his identity and marrying the daughter of the enemy's queen. After fifteen years, the two countries were still at war against each other. Si-lang heard that his elderly mother was leading the Song army at the border. The first scene of the opera begins with Si-lang sighing over the dilemma he was in and longing to see his mother again. These are the most celebrated lyrics.

I'm like a bird in a cage
I have wings but cannot stretch them;
I'm like a tiger away from the mountain
Alone and suffering;
I'm like a wild goose come from the south
Lost from the flight.
I'm like a dragon out of water
Besieged on a sandbank.[49]

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49. This English translation is from Adolphe Clarence Scott, *Traditional Chinese Plays*, vol. 1(University of Wisconsin Press, 1967)., 36. The sentence "I'm like a tiger away from the mountain" is "I'm like a tiger forgotten in the mountain" in the original translation. I made this change to make the translation closer to the original text in Chinese.

These lyrics express a sense of not belonging, a sense of homesickness, and a sense of trauma. When delivered on an American campus, they undoubtedly bore a special significance for those Chinese students living a long distance away from their home country, both for Lu himself, who gave the performance, and among many in his audience.

However, this popular Peking opera was banned and suppressed after the communist party took power. In 1956, a major opera journal, *Xiju Bao,* carried five short articles in a discussion forum titled "'Si-lang tan mu' 'lian huan tao' deng jumu neng bu neng shangyan (Can Si-lang Visits His Mother, Lian Huan Tao, etc. Be Performed or Not)? "[50] These articles labeled the main character, Si-lang, as a traitor. The irony is that the same lyrics from the mouth of a "traitor" had reminded Lu of his love for China while he was in the United States.

In the summer of 1957, as the first batch of students finished their training and the Anti-rightists movement was spreading all over the campus, the secret nuclear program at Beijing University was temporarily brought to an end. The next assignment for Lu was a prominent position in Lanzhou, more than a thousand miles northwest of Beijing, where an important base for separating uranium isotopes was to be built. Much to the program administrators' disappointment, Lu resigned and left Beijing. His work for China's first nuclear program came to an end and his involvement in the first bomb project didn't really start.

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50. An Eh, Yu Ming, et al., "'Si-lang tan mu' 'lian huan tao' deng jumu neng bu neng shangyan? " *Xiju Bao*, 8(1956): 18-19; 9 (1956): 30-31.

The successful explosion of its first atomic bomb in 1964 is seen as a great scientific and technological achievement of a new China. Those scientists who worked on the atomic bomb project are now praised as both scientific heroes and great patriots. By contrast, someone like Lu whose expertise in nuclear physics could have served the program well but was reluctant to do so, is not much favored by contemporary Chinese people who have strong patriotic feelings. Lu decided to return to China to serve his country, but chose not to serve the Chinese atomic bomb program. These two decisions seem to be contradicting each other in a patriotic narrative, but from the perspective of cultural history, especially that of Peking opera, the two decisions merge into a coherent narrative.

While it is impossible to make a causal claim that Peking opera is the reason why Lu returned to China in 1941 and then quit the bomb program in 1957, a cultural history interpretation reveals that Peking opera has a significance in Lu's decisions. It is essential to understand the symbolic meaning of Peking opera in order to understand that Lu's two decisions are coherent in a cultural history narrative while they are not in the old patriotic narrative. This difference is a result of cultural history's fundamental understanding of the way that meanings are produced, transmitted and appropriated surrounding different groups and individuals. Traditional Peking operas were decoded by the revolutionary and exclusive communist ideology, as the dross from the old society, and one particular play — “Si-lang Visits His Mother” — as implying a traitor's philosophy. Yet the same opera could bear the opposite meaning for Lu on more than one occasion. For a long time, he had cultivated a deep appreciation for traditional Peking opera— as a form of art, and

also as an expression of the Chinese way of life. Yet it was precisely because Lu cherished traditional operas as the essence of traditional Chinese culture that should not be given up that he was so alienated by the contemporary rejection of this traditional aspect of his culture. A cultural analysis regains the sense of history, which has been lost by substituting historical complications with mere generalized patriotic sentiment that underlies the narrative of Chinese scientists as "great patriots".

Just as Peking opera was interpreted by Lu with a symbolic meaning that stood in stark contrast with the prevailing ideology of that time, there are signs that the atomic bomb also held a different meaning for Lu in 1957. That position certainly distinguished him from the established modern view widely circulated today among Chinese who view the fact that China was one of the first countries to develop an atomic bomb as a symbol of great national pride. For them, leaving the bomb project was not loving China. Lu made sense of the project differently. Rather than identifying his decision as a lack of loyalty and commitment to his country, he perceived the atomic bomb to embody a quite different meaning. And it is this special meaning for him that might have played into his decision. In his 1947 article on atomic energy and atomic bomb, he wrote:

> ...To invent the machinery that can make secure use of nuclear energy for the purpose of pursuing human well-being pertains to construction. ...To make bombs that can expedite the use of nuclear energy for the purpose of seeking military weapons pertains to destruction. Despite that the protraction of the war has caused it

(the nuclear bomb) to come out first, it is yet an example showing that construction is hard while destruction is easy.[51]

Here Lu was not the first Chinese person to engage in thinking about the relationship between two opposing concepts: destruction and construction. Sun Yat-sen — the founding father of the Nationalist Party and the leader of the Revolution of 1911 — gave such advice in 1912, shortly after the revolution that eventually overthrew the feudal monarchy of China: "it is always harder to build something than knock it down."[52] The dialectics of destruction and construction is vital to any society going through significant transformation. The construction of new social structure and order tends to involve more effort than the destruction of the old ones. Lu endorsed Sun's foresight by a concrete example: the two ways of using atomic energy. Lu took finding the controlled way of using atomic energy as a matter of construction, and the making of the nuclear bomb as a matter of destruction, not only from a sense of difference in their purposes but also from a sense of understanding how their purposes are achieved differently. One is for the purpose of promoting the wellbeing of people, and the other for making weapons. One requires safety and reliability in a longer term, and the other sacrifices these for a quick way to release nuclear energy. In his concluding remarks, he wrote that as more efficient ways of releasing the potential energy in the nucleus would be developed, "the civilization of mankind could be destroyed in no time by a small number of people," and

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51. Lu, "Yuanzineng," 18.
52. Sun Yat-sen, "Zai shanxi shangxuejie yanhui shang de yanshuo"(1912), in *Sun Zhongshan Quanji*, Vol.2, ed. the Institute of Modern History at the Chinese Academy of Social Sciences (Zhonghua Shuju, 1982), 471.

that his prediction about the "special use" of nuclear energy had been verified and applied first to the atomic bomb was "truly regretful."[53]

Lu certainly perceived the atomic bomb as a symbol of the power of massive destruction in his 1947 paper. Ten years later, Chinese society was going towards a massive destruction of cultural traditions, represented strongly but not solely by the Peking opera reform. Cultural tradition is another example of being difficult to build yet easily destroyed. It would take several generations' time for a cultural tradition to be established, and during this process the change is carried through slowly and imperceptibly until it becomes an important part of social life. By the time that the communist party came along, Peking opera had flourished and been rooted deeply in the soil of Chinese culture for more than a century and a half. But the communist policy and ideology positioned itself against this old tradition and wanted it to be condemned, wiped out, and replaced by the new and modern culture propagated by its revolutionary politics. Practicing Peking opera was one important way that Lu had learned and then come to embody Chinese culture. Lu further believed that many old Peking operas represent traditional Chinese ethics. Chinese people should hold on to these traditional values and would lose something fundamental if they gave them up.[54] If first using nuclear energy to make a weapon of mass destruction was against Lu's principles, it went even more against his heart that his favorite part of Chinese culture was being radically twisted and violently exterminated.

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53. Lu, "Yuanzineng," 20.
54. Baoyan Hu, “Wulixue dashi," 37.

While Peking opera and the atomic bomb both had specific significance for Lu, they were correlated with each other in Lu's life in 1957 in Beijing in a symbolic way. Like many other Chinese intellectuals of his generation, the love for Peking opera kept Lu close to Chinese culture and Chinese society. But when his favorite Peking opera, as a symbol of the traditional Chinese culture he was very much intimate with, was being rejected and destroyed by the political ideology of the communist government, he chose to keep a distance from that political authority. While the bomb was being built in China despite the worldwide concern that nuclear weapons would lead to the total destruction of mankind, Lu's favorite old Peking opera and traditional Chinese culture were under violent destruction driven by the communist ideology of building a new world by destroying the old one.

Concluding Remarks: Towards A Cultural History of Western-educated Chinese Scientists

To conclude, I want to remark, more explicitly, on how a case study of Lu points to a prospect of a cultural history of western-educated Chinese scientists in the twentieth century.

The introduction argued that the writing of the life of Chinese scientists who returned to China after receiving western education has been constrained by some narrative conventions. The influence of these narrative conventions is not only prevalent but also so entrenched in the biographies of returned Chinese scientists that it proved difficult to write a biography of Hoff Lu without conforming to the template of escalating or

glorifying him as a scientist or a patriot or, alternatively, attacking him for lack of patriotism in relationship to the bomb.

This paper is written not as a biography, but a cultural history of Lu that considers, yet is not prescribed by, his work as a scientist or his patriotic position. It is a narrative centered on the meanings that were persistent in the daily experience of Lu's life, identifying those that seem significant for interpreting the choices he made in response to the historical events and social changes in twentieth century China. Since cultural history sees meanings as identified with cultures, and cultures as webs of meanings, the layout of all kinds of meanings in Lu's life also unfolds the cultural picture of twentieth-century China, in which the major forces at play were the unsettling tensions between Chinese culture and western influence, between the old tradition and the increasing demand for a new modern culture marked by unprecedented progress in science and technology.

Looking into the future of cultural history, P. Burke has claimed that cultural history is unlikely to disappear for one reason, "the importance of cultural encounters in our time, generating an increasingly urgent need to understand them in the past."[55] The transmission of western science and the ideas of modernity into China is also a process of encounter between Chinese culture and western culture. As a Chinese scientist educated in the West, Lu was one of the first generations of Chinese intellectuals who assimilated themselves into the world of western science and modern thinking but also carried on the Chinese tradition. They lived across the boundaries between two cultures and stood at the frontiers of a cultural encounter. Narratives of their lives will shed light on the spatiality

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55. Peter Burke, *What Is Cultural History* (Polity, 2008), 121

and temporality of modernity in a setting of cultural encounters. The dual nature of their identity reveals the differences and conflicts between the two cultures, but it also carries the messages important for people in both cultures to understand each other better. This author wants to cheer on a hope with which Burke ends the afterword added to the second edition of his book but suggested first by Brazilian historian and anthropologist Gilberto Freyre in 1950. "While political and military history, pursued in a nationalist style, often drives peoples apart," the study of the cultural history of returned Chinese scientists might be a way to "bring peoples together and open ways of understanding and communication" not only between peoples from two different cultures,[56] but also between people in the past and people in the present.

Such a dialogue may well start by integrating the cultural history approach into the study of the history of western-educated Chinese scientists. Cultural history is still very much a European territory at the present time. Not only are the overwhelming numbers of contemporary cultural historians residing in Europe and the United States, but the scholarship that has been produced in cultural history is also focused on subjects such as French Revolution and the Enlightenment. The prospect of a cultural history of western-educated Chinese scientists will bridge the geographical gap between the methodologies of narrative taken by historians in Europe and in China.

Last but not the least, I strongly propose the prospect of a cultural history of western-educated Chinese scientists, as cultural history may carry the best hope to realize the kind

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56. Ibid. 143.

of promise history holds that makes the study of the past so vital to our humanity. It is well articulated by cultural historian, Robert Darnton, in the following words:

> The most exciting and innovative varieties of history are those that try to dig beneath events in order to uncover the human condition as it was experienced by our predecessors. These varieties go under many names: the history of mentalities, the social history of ideas, ethnographic history, or just cultural history (my own preference). But whatever the label, the ambition is the same: to understand the meaning of life, not by a vain attempt to provide ultimate answers to the great philosophical conundrums but by providing access to answers that others have made, in the daily rounds of their existence as well as in the formal organization of their ideas, centuries ago.[57]

Perhaps there is no better way to convey the very core message of cultural history and, to end this paper, than borrowing those words from Darnton. It is also the best way to describe the most exciting and engaging journey that I have ever taken, while researching and writing Lu's life. It is a journey in search of the meaning of his life, as a western-educated Chinese student, as nuclear physicist, as a Peking opera lover, and as a human being, the meanings of which were somehow connected in the everyday life he has lived through. Even though the ways people in the 20th century thought and acted do not seem to be as bizarre as the life of the 18th century which Darnton wrote about, this paper has shown that certain meanings that were cherished by Lu's generation of western-educated Chinese scientists in relation to biculturalism and modernity have faded away from the

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57. Robert Darnton, *The Kiss of Lamourette: Reflections in Cultural History* (W.W. Norton & Company, 1990), xix.

nationalization and modernization discourse of modern China. It is history, especially cultural history, that should be called on to come to its rescue from losing that vital part of humanity. Hopefully this paper is not the end of the journey, but only a start.

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